

## CLAIMS

**What is claimed is**

1. A method for making measurements during drilling of a borehole, the method comprising:
    - (a) making measurements continuously with a formation evaluation (FE) sensor on a bottom hole assembly (BHA) over a time period that includes during said drilling of said borehole;
    - (b) concurrently making quality control (QC) measurements while said FE measurements are being made, said QC measurements including at least one measurement not related to motion of said BHA;
    - (c) storing samples of said FE measurements in a working memory of a processor on said BHA;
    - (d) analyzing said QC measurements; and
    - (e) based on said analysis, storing selected samples of said FE measurements in a permanent memory of said processor.
  2. The method of claim 1 wherein said FE sensor comprises at least one hydrophone responsive to a seismic signal from a surface source.
  3. The method of claim 1 wherein said FE sensor comprises at least one geophone on a non-rotating sleeve of said BHA, said at least one geophone responsive to a seismic signal from a surface source.

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1       4. The method of claim 1 wherein said at least one measurement is selected from (i)  
2           a weight on bit (WOB), (ii) flow rate of a fluid in said borehole, (iii) a level of a  
3           tube wave in said borehole, (iv) a level of motion of a non-rotating sleeve on said  
4           BHA, and (v) a measurement made by a near bit accelerometer.

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1       5. The method of claim 1 wherein said QC measurements further comprise a  
2           measurement of motion of said BHA.

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1       6. The method of claim 1 wherein said FE sensor comprises an accelerometer  
2           responsive to a signal from a surface source.

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1       7. The method of claim 1 wherein said FE sensor comprises an acoustic sensor  
2           responsive to a signal from a source in another borehole.

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1       8. A method for making measurements during drilling of a borehole, the method  
2           comprising:-

3           (a)     making quality control (QC) measurements using a sensor on a bottom  
4                hole assembly BHA during drilling of said borehole, said QC  
5                measurements including at least one measurement not related to a motion  
6                of said BHA;  
7           (b)     analyzing said QC measurements;

- (c) predicting an initial time when measurements made by a formation evaluation (FE) sensor on said BHA are expected to be of acceptable quality; and
  - (d) making measurements with said FE sensor over a time interval that starts earlier than said initial time.

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9. The method of claim 1 wherein said FE sensor comprises an acoustic sensor responsive to a signal from a source at at least one of (i) a surface location, and, (ii) in another borehole.

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10. The method of claim 1 wherein said acoustic sensor is one of (i) a hydrophone, (ii) a geophone, and, (iii) an accelerometer.

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11. The method of claim 8 wherein said predicting is based at least in part on measurements made by an axial accelerometer on the BHA.

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12. The method of claim 8 wherein said predicting is based at least in part on monitoring of a mud flow in said borehole.